CLAIMS

1. (Currently amended) A medical article comprising an implantable substrate having a coating, the coating including a polymeric product of a reaction between a first reagent, a second reagent, and a third reagent, wherein:

(a) the first reagent is selected from a group consisting of compounds having formulae (1), (2), (3), and (4):


(1)


(2)


(3)

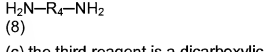

(4)

(b) the second reagent is selected from a group consisting of compounds having formulae (5), (6), (7), and (8):

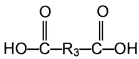

(5)


(6)

(7)


(8)

(c) the third reagent is a dicarboxylic acid having the formula (9):



(9)

wherein:

R_1 is hydrogen, methyl, *iso*-propyl, *sec*-butyl; *iso*-butyl, or benzyl group;

R_2 is methylene, methylmethylene, *n*-propylene, *iso*-propylene, ethylmethylene, *n*-butylene, *iso*-butylene, *sec*-butylene, or *n*-amylene group;

R_3 is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is an integer between 2 and 12;

R_4 is a moiety derived from a compound selected from a group consisting of poly(ethylene glycol), poly(propylene glycol), random poly(ethylene glycol-co-propylene glycol), poly(ethylene glycol)-block-poly(propylene glycol)~~, hyaluronic acid, poly(2-hydroxyethyl methacrylate), poly(3-hydroxypropylmethacrylamide), poly(styrene sulfonate)~~, and poly(vinyl pyrrolidone)~~, and cellulosics~~;

X is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is an integer between 2 and 12; and

Y is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is 1, 2, or 5.

2. (Original) The medical article of Claim 1, wherein the implantable substrate is a stent.

3. (Original) The medical article of Claim 1, wherein the compound of formula (1) is a diol-diamine, the diol-diamine is a product of condensation of an amino acid and a diol.

4. (Original) The medical article of Claim 3, wherein the amino acid has the formula (10):

$H_2N{-}CHR_1{-}COOH.$ (10)

5. (Original) The medical article of Claim 3, wherein the amino acid is selected from a group consisting of glycine, alanine, valine, isoleucine, leucine, and phenyl alanine.

6. (Original) The medical article of Claim 3, wherein a diol is selected from a group consisting of ethylene glycol, 1,3-propanediol, 1,4-butane diol, 1,5-pentanediol, 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol, 1,9-nonanediol, 1,10-decanediol, 1,11-undecanediol, and 1,12-dodecanediol.

7. (Withdrawn) The medical article of Claim 1, wherein the compound of formula (2) is an amidediol, the amidediol is a product of condensation of a hydroxy acid and a diamine.

8. (Withdrawn) The medical article of Claim 7, wherein the hydroxy acid has the formula (11):

$HO{-}R_2{-}COOH.$ (11)

9. (Withdrawn) The medical article of Claim 7, wherein the hydroxy acid is selected from a group consisting of glycolic acid, lactic acid, β-hydroxybutyric acid, α-hydroxyvaleric acid, and ε–hydroxycaproic acid.

10. (Withdrawn) The medical article of Claim 7, wherein the diamine is selected from a group consisting of putrescine, 1,2-ethanediamine, and cadavarene.

11. (Withdrawn) The medical article of Claim 1, wherein the compound of formula (3) is selected from a group consisting of ethylene glycol, 1,3-propanediol, 1,4-butane diol, 1,5-pentanediol, 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol, 1,9-nonanediol, 1,10-decanediol, 1,11-undecanediol, and 1,12-dodecanediol.

12. (Withdrawn) The medical article of Claim 1, wherein the compound of formula (4) is selected from a group consisting of putrescine, 1,2-ethanediamine, and cadavarene.

13. (Original) The medical article of Claim 1, wherein the compound of formula (5) is a PEG-diester-diamine conjugate, the conjugate is a product of condensation of an amino acid and poly(ethylene glycol).

14. (Original) The medical article of Claim 13, wherein the amino acid has the formula (10):

$H_2N{-}CHR_1{-}COOH.$

(10)

15. (Original) The medical article of Claim 13, wherein the amino acid is selected from a group consisting of glycine, alanine, valine, isoleucine, leucine, phenyl alanine, tyrosine, serine, and glutamic acid.

16. (Withdrawn) The medical article of Claim 1, wherein the compound of formula (6) is a PEG-amidediol conjugate, the conjugate is a product of condensation of a hydroxy acid and PEG-diamine.

17. (Withdrawn) The medical article of Claim 16, wherein the hydroxy acid has the formula (11):

$$HO{-}R_2{-}COOH. \qquad (11)$$

18. (Withdrawn) The medical article of Claim 17, wherein the hydroxy acid is selected from a group consisting of glycolic acid, lactic acid, β-hydroxybutyric acid, α-hydroxyvaleric acid, and ε–hydroxycaproic acid.

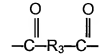
19. (Currently amended) A medical article comprising an implantable substrate having a coating, the coating including a copolymer having a general formula (12) or (13):

$$-[M{-}P]_m{-}[M{-}Q]_n- \qquad (12)$$

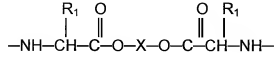
$$-[M_1{-}P]_p- \qquad (13)$$

wherein:

M is a moiety represented by the structure having the formula (14)


(14)

P is a moiety selected from a group consisting of structures having the formulae (15), (16), (17), and (18):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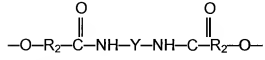
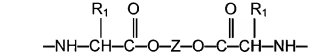

(16)

(17)

(18)

Q is a moiety selected from a group consisting of structures having the formulae (19), (20), and (21)



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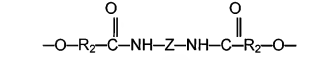

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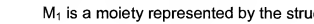
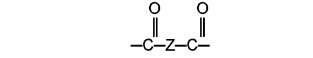


(21)

M_1 is a moiety represented by the structure having the formula (22):



(22)

R_1 is hydrogen, methyl, *iso*-propyl, *sec*-butyl; *iso*-butyl, or benzyl group;

R_2 is methylene, methylmethylene, *n*-propylene, *iso*-propylene, ethylmethylene, *n*-butylene, *iso*-butylene, *sec*-butylene, or *n*-amylene group;

R_3 is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is an integer between 2 and 12;

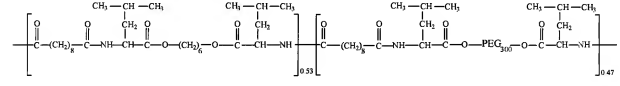
X is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is an integer between 2 and 12;

Y is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is 1, 2, or 5;

Z is a moiety derived from a compound selected from a group consisting of poly(ethylene glycol), poly(propylene glycol), random poly(ethylene glycol-co-propylene glycol), poly(ethylene glycol)-block-poly(propylene glycol)~~, hyaluronic acid, poly(2-hydroxyethyl methacrylate), poly(3-hydroxypropylmethacrylamide), poly(styrene sulfonate)~~, and poly(vinyl pyrrolidone~~, and cellulosics~~; and

m, n, and p are integers where the value of m is between 5 and 1,800, the value of n is between 1 and 800 and the value of p is between 4 and 1,500.

20. (Original) The medical article of Claim 19, wherein the polymer is selected from a group consisting of copolymers of formulae (23), (24), (25), (26), (27), (28), (29), (30), (31), (32), (33), (34), (35), (36), (37), (38), (39), (40), (41), (42), and (43):



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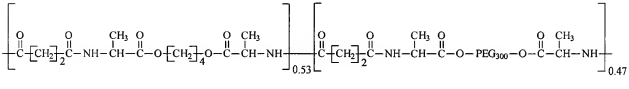

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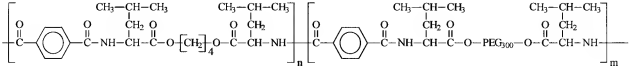

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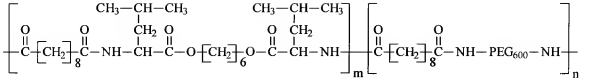

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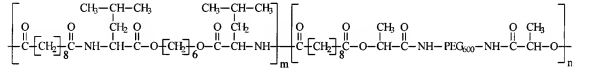

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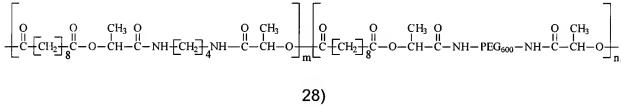

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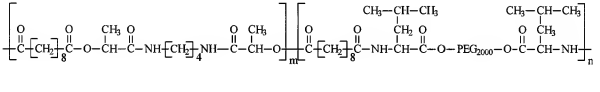

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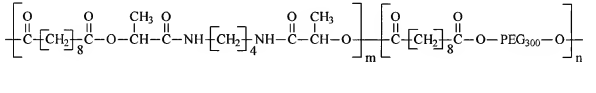

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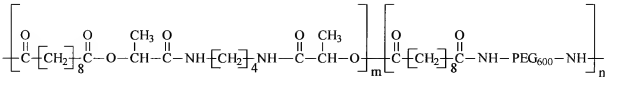

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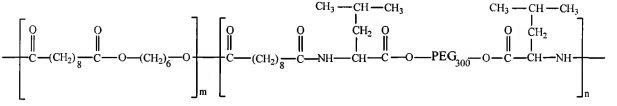

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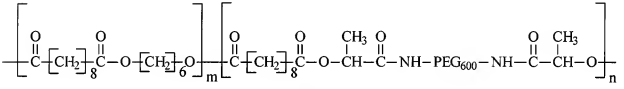

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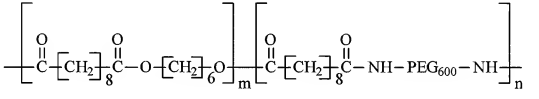

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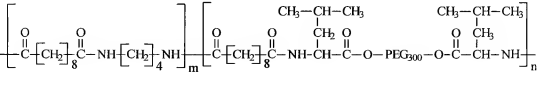

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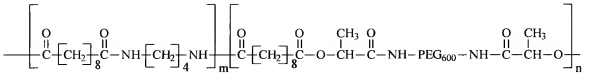

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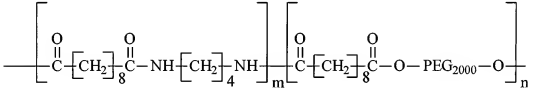

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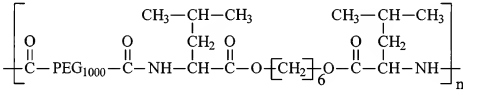

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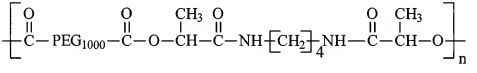

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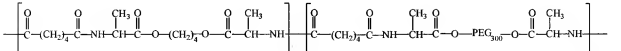

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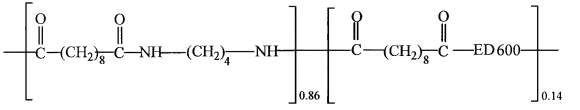

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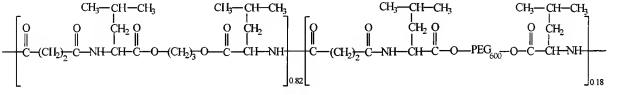

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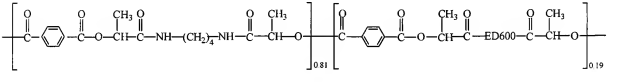
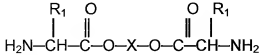


(43)

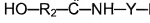
21. (Currently amended) A method for fabricating a medical article, the method including synthesizing a copolymer and forming a coating based on the copolymer on at least a portion of an implantable substrate, the synthesizing of the copolymer including reacting a first reagent with a second reagent and with a third reagent, wherein:

(a) the first reagent is selected from a group consisting of compounds having formulae (1), (2), (3), and (4):



(1)

(2)



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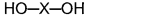
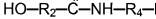


(4)

(b) the second reagent is selected from a group consisting of compounds having formulae (5), (6), (7), and (8):

(5)

(6)



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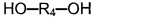


(8)

(c) the third reagent is a dicarboxylic acid having the formula (9):

(9)

wherein:

R_1 is hydrogen, methyl, *iso*-propyl, *sec*-butyl; *iso*-butyl, or benzyl group;

R_2 is methylene, methylmethylene, *n*-propylene, *iso*-propylene, ethylmethylene, *n*-butylene, *iso*-butylene, *sec*-butylene, or *n*-amylene group;

R_3 is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is an integer between 2 and 12;

R_4 is a moiety derived from a compound selected from a group consisting of poly(ethylene glycol), poly(propylene glycol), random poly(ethylene glycol-co-propylene glycol), poly(ethylene glycol)-block-poly(propylene glycol)~~, hyaluronic acid, poly(2-hydroxyethyl methacrylate), poly(3-hydroxypropylmethacrylamide), poly(styrene sulfonate),~~ and poly(vinyl pyrrolidone)~~, and cellulosics~~;

X is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is an integer between 2 and 12;

Y is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is 1, 2, or 5.

22. (Original) The method of Claim 21, wherein the implantable substrate is a stent.

23. (Original) The method of Claim 21, wherein the molar ratio between the first reagent, the second reagent, and the third reagent is about 1:1:2.

24. (Original) The method of Claim 21, wherein the compound of formula (1) is a diol-diamine, the diol-diamine is a product of condensation of an amino acid and a diol.

25. (Withdrawn) The method of Claim 24, wherein the amino acid has the formula (10):

$H_2N–CHR_1–COOH.$ (10)

26. (Original) The method of Claim 24, wherein the amino acid is selected from a group consisting of glycine, alanine, valine, isoleucine, leucine, and phenyl alanine.

27. (Original) The method of Claim 24, wherein a diol is selected from a group consisting of ethylene glycol, 1,3-propanediol, 1,4-butane diol, 1,5-pentanediol, 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol, 1,9-nonanediol, 1,10-decanediol, 1,11-undecanediol, and 1,12-dodecanediol.

28. (Withdrawn) The method of Claim 21, wherein the compound of formula (2) is an amidediol, the amidediol is a product of condensation of a hydroxy acid and a diamine.

29. (Withdrawn) The method article of Claim 28, wherein the hydroxy acid has the formula (11):

$$HO{-}R_2{-}COOH. \qquad (11)$$

30. (Withdrawn) The method of Claim 28, wherein the hydroxy acid is selected from a group consisting of glycolic acid, lactic acid, β-hydroxybutyric acid, α-hydroxyvaleric acid, and ε–hydroxycaproic acid.

31. (Withdrawn) The method of Claim 28, wherein the diamine is selected from a group consisting of putrescine, 1,2-ethanediamine, and cadavarene.

32. (Withdrawn) The method of Claim 21, wherein the compound of formula (3) is selected from a group consisting of ethylene glycol, 1,3-propanediol, 1,4-butane diol, 1,5-pentanediol, 1,6-hexanediol, 1,7-heptanediol, 1,8-octanediol, 1,9-nonanediol, 1,10-decanediol, 1,11-undecanediol, and 1,12-dodecanediol.

33. (Withdrawn) The method of Claim 21, wherein the compound of formula (4) is selected from a group consisting of putrescine, 1,2-ethanediamine, and cadavarene.

34. (Original) The method of Claim 21, wherein the compound of formula (5) is a PEG-diester-diamine conjugate, the conjugate is a product of condensation of an amino acid and poly(ethylene glycol).

35. (Withdrawn) The method of Claim 34, wherein the amino acid has the formula (10):

$H_2N–CHR_1–COOH.$ (10)

36. (Withdrawn) The method of Claim 34, wherein the amino acid is selected from a group consisting of glycine, alanine, valine, isoleucine, leucine, phenyl alanine, tyrosine, serine, and glutamic acid.

37. (Withdrawn) The method of Claim 21, wherein the compound of formula (6) is a PEG-amidediol conjugate, the conjugate is a product of condensation of a hydroxy acid and PEG-diamine.

38. (Withdrawn) The method of Claim 37, wherein the hydroxy acid has the formula (11):

$HO–R_2–COOH.$ (11)

39. (Withdrawn) The method of Claim 37, wherein the hydroxy acid is selected from a group consisting of glycolic acid, lactic acid, β-hydroxybutyric acid, α-hydroxyvaleric acid, and ε–hydroxycaproic acid.

40. (Currently amended) A method for fabricating a medical article, the method including synthesizing a copolymer and forming a coating based on the copolymer on at

least a portion of an implantable substrate, wherein the copolymer has a general formula (12) or (13):

$$-[M-P]_m-[M-Q]_n- \quad (12)$$

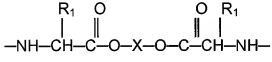
$$-[M_1-P]_p- \quad (13)$$

wherein:

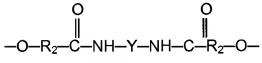
M is a moiety represented by the structure having the formula (14)

(14)

P is a moiety selected from a group consisting of structures having the formulae (15), (16), (17), and (18):



(15)

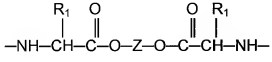


(16)

(17)

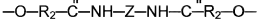
(18)

Q is a moiety selected from a group consisting of structures having the formulae (19), (20), and (21)



(19)

(20)



(21)

M_1 is a moiety represented by the structure having the formula (22):

(22)

R_1 is hydrogen, methyl, *iso*-propyl, *sec*-butyl; *iso*-butyl, or benzyl group;

R_2 is methylene, methylmethylene, *n*-propylene, *iso*-propylene, ethylmethylene, *n*-butylene, *iso*-butylene, *sec*-butylene, or *n*-amylene group;

R_3 is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is an integer between 2 and 12;

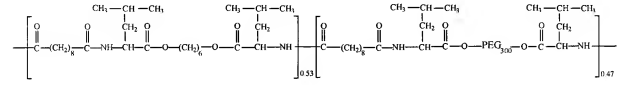
X is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is an integer between 2 and 12;

Y is a straight chained or branched aliphatic alkylene group C_nH_{2n}, wherein n is 1, 2, or 5; and

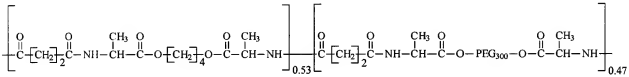
Z is a moiety derived from a compound selected from a group consisting of poly(ethylene glycol), poly(propylene glycol), random poly(ethylene glycol-co-propylene glycol), poly(ethylene glycol)-block-poly(propylene glycol), ~~hyaluronic acid, poly(2-hydroxyethyl methacrylate), poly(3-hydroxypropylmethacrylamide), poly(styrene sulfonate),~~ and poly(vinyl pyrrolidone~~, and cellulosics~~; and

m, n, and p are integers where the value of m is between 5 and 1,800, the value of n is between 1 and 800 and the value of p is between 4 and 1,500.

41. (Original) The method of Claim 40, wherein the copolymer is selected from a group consisting of copolymers of formulae (23), (24), (25), (26), (27), (28), (29), (30), (31), (32), (33), (34), (35), (36), (37), (38), (39), (40), (41), (42), and (43):



(23)



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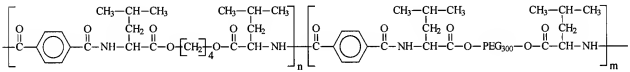

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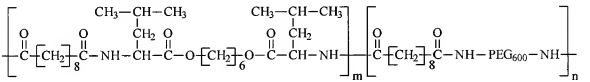

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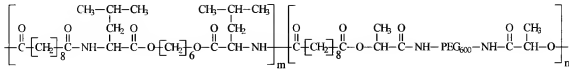

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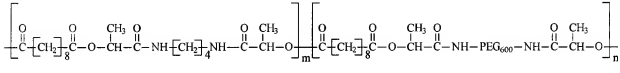

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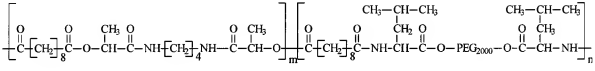

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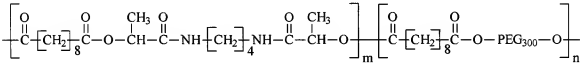

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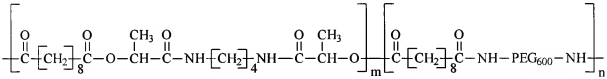

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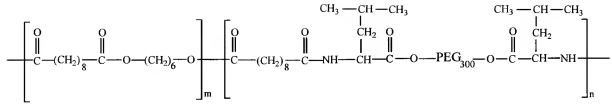

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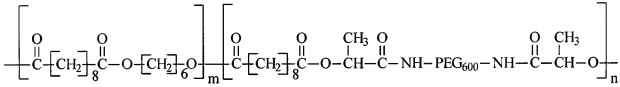

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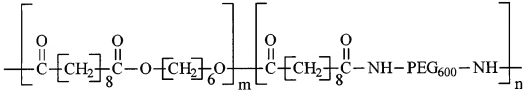

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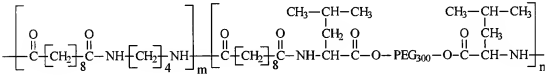

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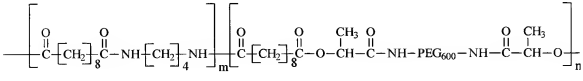

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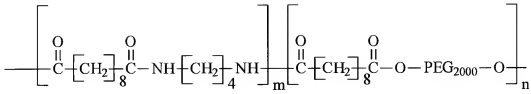

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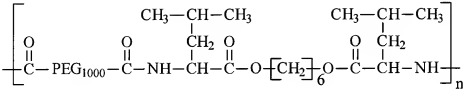

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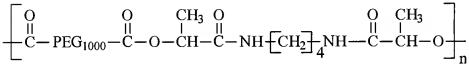

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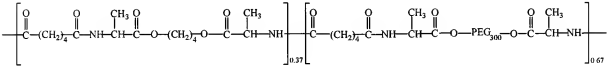

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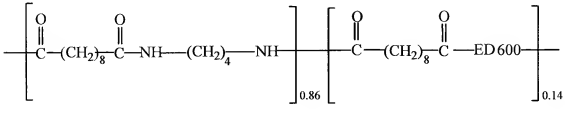

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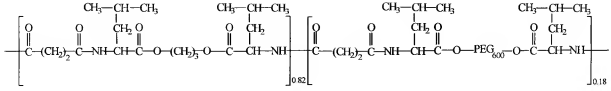

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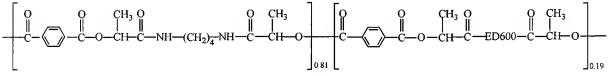

(43)